

SEQUENCE LISTING

<110> Sakaki Yoshiyuki
Tei, Hajime

<120> Mammalian Genes Involved in Circadian Periods

<130> SPO-108

<140> US 09/508,342

<141> 2000-03-10

<150> JP 9/267846

<151> 1997-09-12

<160> 4

<210> 1

<211> 1290

<212> PRT

<213> Homo sapiens

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Gly Glu Ser Phe Cys Pro Gly Gly Val Pro Ser Pro Gly Pro Pro Gln
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His Arg Pro Cys Pro Gly Pro Ser Leu Ala Asp Asp Thr Asp Ala Asn
35 40 45

Ser Asn Gly Ser Ser Gly Asn Glu Ser Asn Gly His Glu Ser Arg Gly
50 55 60

Ala Ser Gln Arg Ser Ser His Ser Ser Ser Gly Asn Gly Lys Asp
65 70 75 80

Ser Ala Leu Leu Glu Thr Thr Glu Ser Ser Lys Ser Thr Asn Ser Gln
85 90 95

Ser Pro Ser Pro Pro Ser Ser Ser Ile Ala Tyr Ser Leu Leu Ser Ala
100 105 110

Ser Ser Glu Gln Asp Asn Pro Ser Thr Ser Gly Cys Ser Ser Glu Gln
115 120 125

Ser Ala Arg Ala Arg Thr Gln Lys Glu Leu Met Thr Ala Leu Arg Glu
130 135 140

Leu Lys Leu Arg Leu Pro Pro Glu Arg Arg Gly Lys Gly Arg Ser Gly
145 150 155 160

Thr Leu Ala Thr Leu Gln Tyr Ala Leu Ala Cys Val Lys Gln Val Gln
 165 170 175

Ala Asn Gln Glu Tyr Tyr Gln Gln Trp Ser Leu Glu Glu Gly Glu Pro
 180 185 190

Cys Ser Met Asp Met Ser Thr Tyr Thr Leu Glu Glu Leu Glu His Ile
 195 200 205

Thr Ser Glu Tyr Thr Leu Gln Asn Gln Asp Thr Phe Ser Val Ala Val
 210 215 220

Ser Phe Leu Thr Gly Arg Ile Val Tyr Ile Ser Glu Gln Ala Ala Val
 225 230 235 240

Leu Leu Arg Cys Lys Arg Asp Val Phe Arg Gly Thr Arg Phe Ser Glu
 245 250 255

Leu Leu Ala Pro Gln Asp Val Gly Val Phe Tyr Gly Ser Thr Ala Pro
 260 265 270

Ser Arg Leu Pro Thr Trp Gly Thr Gly Ala Ser Ala Gly Ser Gly Leu
 275 280 285

Arg Asp Phe Thr Gln Glu Lys Ser Val Phe Cys Arg Ile Arg Gly Gly
 290 295 300

Pro Asp Arg Asp Pro Gly Pro Arg Tyr Gln Pro Phe Arg Leu Thr Pro
 305 310 315 320

Tyr Val Thr Lys Ile Arg Val Ser Asp Gly Ala Pro Ala Gln Pro Cys
 325 330 335

Cys Leu Leu Ile Ala Glu Arg Ile His Ser Gly Tyr Glu Ala Pro Arg
 340 345 350

Ile Pro Pro Asp Lys Arg Ile Phe Thr Thr Arg His Thr Pro Ser Cys
 355 360 365

Leu Phe Gln Asp Val Asp Glu Arg Ala Ala Pro Leu Leu Gly Tyr Leu
 370 375 380

Pro Gln Asp Leu Leu Gly Ala Pro Val Leu Leu Phe Leu His Pro Glu
 385 390 395 400

Asp Arg Pro Leu Met Leu Ala Ile His Lys Lys Ile Leu Gln Leu Ala
 405 410 415

Gly Gln Pro Phe Asp His Ser Pro Ile Arg Phe Cys Ala Arg Asn Gly
 420 425 430

Glu Tyr Val Thr Met Asp Thr Ser Trp Ala Gly Phe Val His Pro Trp
 435 440 445

Ser Arg Lys Val Ala Phe Val Leu Gly Arg His Lys Val Arg Thr Ala
 450 455 460

Pro Leu Asn Glu Asp Val Phe Thr Pro Pro Ala Pro Ser Pro Ala Pro
465 470 475 480

Ser Leu Asp Thr Asp Ile Gln Glu Leu Ser Glu Gln Ile His Arg Leu
485 490 495

Leu Leu Gln Pro Val His Ser Pro Ser Pro Thr Gly Leu Cys Gly Val
500 505 510

Gly Ala Val Thr Ser Pro Gly Pro Leu His Ser Pro Gly Ser Ser Ser
515 520 525

Asp Ser Asn Gly Gly Asp Ala Glu Gly Pro Gly Pro Pro Ala Pro Val
530 535 540

Thr Phe Gln Gln Ile Cys Lys Asp Val His Leu Val Lys His Gln Gly
545 550 555 560

Gln Gln Leu Phe Ile Glu Ser Arg Ala Arg Pro Gln Ser Arg Pro Arg
565 570 575

Leu Pro Ala Thr Gly Thr Phe Lys Ala Lys Ala Leu Pro Cys Gln Ser
580 585 590

Pro Asp Pro Glu Leu Glu Ala Gly Ser Ala Pro Val Gln Ala Pro Leu
595 600 605

Ala Leu Val Pro Glu Glu Ala Glu Arg Lys Glu Ala Ser Ser Cys Ser
610 615 620

Tyr Gln Gln Ile Asn Cys Leu Asp Ser Ile Leu Arg Tyr Leu Glu Ser
625 630 635 640

Cys Asn Leu Pro Ser Thr Thr Lys Arg Lys Cys Ala Ser Ser Ser Ser
645 650 655

Tyr Thr Thr Ser Ser Ala Ser Asp Asp Asp Arg Gln Arg Thr Gly Pro
660 665 670

Val Ser Val Gly Thr Lys Lys Asp Pro Pro Ser Ala Ala Leu Ser Gly
675 680 685

Glu Gly Ala Thr Pro Arg Lys Glu Pro Val Val Gly Gly Thr Leu Ser
690 695 700

Pro Leu Ala Leu Ala Asn Lys Ala Glu Ser Val Val Ser Val Thr Ser
705 710 715 720

Gln Cys Ser Phe Ser Ser Thr Ile Val His Val Gly Asp Lys Lys Pro
725 730 735

Pro Glu Ser Asp Ile Ile Met Met Glu Asp Leu Pro Gly Leu Ala Pro
740 745 750

Gly Pro Ala Pro Ser Pro Ala Pro Ser Pro Thr Val Ala Pro Asp Pro
755 760 765

Ala Pro Asp Ala Tyr Arg Pro Val Gly Leu Thr Lys Ala Val Leu Ser
770 775 780

Leu His Thr Gln Lys Glu Glu Gln Ala Phe Leu Ser Arg Phe Arg Asp
785 790 795 800

Leu Gly Arg Leu Arg Gly Leu Asp Ser Ser Ser Thr Ala Pro Ser Ala
805 810 815

Leu Gly Glu Arg Gly Cys His His Gly Pro Ala Pro Pro Ser Arg Arg
820 825 830

His His Cys Arg Ser Lys Ala Lys Arg Ser Arg His His Gln Asn Pro
835 840 845

Arg Ala Glu Ala Pro Cys Tyr Val Ser His Pro Ser Pro Val Pro Pro
850 855 860

Ser Thr Pro Trp Pro Thr Pro Pro Ala Thr Thr Pro Phe Pro Ala Val
865 870 875 880

Val Gln Pro Tyr Pro Leu Pro Val Phe Ser Pro Arg Gly Gly Pro Gln
885 890 895

Pro Leu Pro Pro Ala Pro Thr Ser Val Pro Pro Ala Ala Phe Pro Ala
900 905 910

Pro Leu Val Thr Pro Met Val Ala Leu Val Leu Pro Asn Tyr Leu Phe
915 920 925

Pro Thr Pro Ser Ser Tyr Pro Tyr Gly Ala Leu Gln Thr Pro Ala Glu
930 935 940

Gly Pro Pro Thr Pro Ala Ser His Ser Pro Ser Pro Ser Leu Pro Ala
945 950 955 960

Leu Pro Pro Ser Pro Pro His Arg Pro Asp Ser Pro Leu Phe Asn Ser
965 970 975

Arg Cys Ser Ser Pro Leu Gln Leu Asn Leu Leu Gln Leu Glu Glu Leu
980 985 990

Pro Arg Ala Glu Gly Ala Ala Val Ala Gly Gly Pro Gly Ser Ser Ala
995 1000 1005

Gly Pro Pro Pro Pro Ser Ala Glu Ala Ala Glu Pro Glu Ala Arg Leu
1010 1015 1020

Ala Glu Val Thr Glu Ser Ser Asn Gln Asp Ala Leu Ser Gly Ser Ser
1025 1030 1035 1040

Asp Leu Leu Glu Leu Leu Leu Gln Glu Asp Ser Arg Ser Gly Thr Gly
1045 1050 1055

Ser Ala Ala Ser Gly Ser Leu Gly Ser Gly Leu Gly Ser Gly Ser Gly
1060 1065 1070

Ser Gly Ser His Glu Gly Gly Ser Thr Ser Ala Ser Ile Thr Arg Ser
 1075 1080 1085

Ser Gln Ser Ser His Thr Ser Lys Tyr Phe Gly Ser Ile Asp Ser Ser
 1090 1095 1100

Glu Ala Glu Ala Gly Ala Ala Arg Gly Gly Ala Glu Pro Gly Asp Gln
 1105 1110 1115 1120

Val Ile Lys Tyr Val Leu Gln Asp Pro Ile Trp Leu Leu Met Ala Asn
 1125 1130 1135

Ala Asp Gln Arg Val Met Met Thr Tyr Gln Val Pro Ser Arg Asp Met
 1140 1145 1150

Thr Ser Val Leu Lys Gln Asp Arg Glu Arg Leu Arg Ala Met Gln Lys
 1155 1160 1165

Gln Gln Pro Arg Phe Ser Glu Asp Gln Arg Arg Glu Leu Gly Ala Val
 1170 1175 1180

His Ser Trp Val Arg Lys Gly Gln Leu Pro Arg Ala Leu Asp Val Met
 1185 1190 1195 1200

Ala Cys Val Asp Cys Gly Ser Ser Thr Gln Asp Pro Gly His Pro Asp
 1205 1210 1215

Asp Pro Leu Phe Ser Glu Leu Asp Gly Leu Gly Leu Glu Pro Met Glu
 1220 1225 1230

Glu Gly Gly Glu Gln Gly Ser Ser Gly Gly Ser Gly Glu Gly
 1235 1240 1245

Glu Gly Cys Glu Glu Ala Gln Gly Gly Ala Lys Ala Ser Ser Ser Gln
 1250 1255 1260

Asp Leu Ala Met Glu Glu Glu Glu Gly Arg Ser Ser Ser Ser Pro
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Ala Leu Pro Thr Ala Gly Asn Cys Thr Ser
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 <212> PRT
 <213> Mus musculus

<400> 2

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His Arg Pro Cys Pro Gly Pro Ser Leu Ala Asp Asp Thr Asp Ala Asn
 35 40 45

Ser Asn Gly Ser Ser Gly Asn Glu Ser Asn Gly Pro Glu Ser Arg Gly
 50 55 60

Ala Ser Gln Arg Ser Ser His Ser Ser Ser Gly Asn Gly Lys Asp
 65 70 75 80

Ser Ala Leu Leu Glu Thr Thr Glu Ser Ser Lys Ser Thr Asn Ser Gln
 85 90 95

Ser Pro Ser Pro Pro Ser Ser Ile Ala Tyr Ser Leu Leu Ser Ala
 100 105 110

Ser Ser Glu Gln Asp Asn Pro Ser Thr Ser Gly Cys Ser Ser Glu Gln
 115 120 125

Ser Ala Arg Ala Arg Thr Gln Lys Glu Leu Met Thr Ala Leu Arg Glu
 130 135 140

Leu Lys Leu Arg Leu Pro Pro Glu Arg Arg Gly Lys Gly Arg Ser Gly
 145 150 155 160

Thr Leu Ala Thr Leu Gln Tyr Ala Leu Ala Cys Val Lys Gln Val Gln
 165 170 175

Ala Asn Gln Glu Tyr Tyr Gln Gln Trp Ser Leu Glu Glu Gly Glu Pro
 180 185 190

Cys Ala Met Asp Met Ser Thr Tyr Thr Leu Glu Glu Leu Glu His Ile
 195 200 205

Thr Ser Glu Tyr Thr Leu Arg Asn Gln Asp Thr Phe Ser Val Ala Val
 210 215 220

Ser Phe Leu Thr Gly Arg Ile Val Tyr Ile Ser Glu Gln Ala Gly Val
 225 230 235 240

Leu Leu Arg Cys Lys Arg Asp Val Phe Arg Gly Ala Arg Phe Ser Glu
 245 250 255

Leu Leu Ala Pro Gln Asp Val Gly Val Phe Tyr Gly Ser Thr Thr Pro
 260 265 270

Ser Arg Leu Pro Thr Trp Gly Thr Gly Thr Ser Ala Gly Ser Gly Leu
 275 280 285

Lys Asp Phe Thr Gln Glu Lys Ser Val Phe Cys Arg Ile Arg Gly Gly
 290 295 300

Pro Asp Arg Asp Pro Gly Pro Arg Tyr Gln Pro Phe Arg Leu Thr Pro
 305 310 315 320

Tyr Val Thr Lys Ile Arg Val Ser Asp Gly Ala Pro Ala Gln Pro Cys
 325 330 335

Cys Leu Leu Ile Ala Glu Arg Ile His Ser Gly Tyr Glu Ala Pro Arg
340 345 350

Ile Pro Pro Asp Lys Arg Ile Phe Thr Thr Arg His Thr Pro Ser Cys
355 360 365

Leu Phe Gln Asp Val Asp Glu Arg Ala Ala Pro Leu Leu Gly Tyr Leu
370 375 380

Pro Gln Asp Leu Leu Gly Ala Pro Val Leu Leu Phe Leu His Pro Glu
385 390 395 400

Asp Arg Pro Leu Met Leu Ala Ile His Lys Lys Ile Leu Gln Leu Ala
405 410 415

Gly Gln Pro Phe Asp His Ser Pro Ile Arg Phe Cys Ala Arg Asn Gly
420 425 430

Glu Tyr Val Thr Met Asp Thr Ser Trp Ala Gly Phe Val His Pro Trp
435 440 445

Ser Arg Lys Val Ala Phe Val Leu Gly Arg His Lys Val Arg Thr Ala
450 455 460

Pro Leu Asn Glu Asp Val Phe Thr Pro Pro Ala Pro Ser Pro Ala Pro
465 470 475 480

Ser Leu Asp Ser Asp Ile Gln Glu Leu Ser Glu Gln Ile His Arg Leu
485 490 495

Leu Leu Gln Pro Val His Ser Ser Pro Thr Gly Leu Cys Gly Val
500 505 510

Gly Pro Leu Met Ser Pro Gly Pro Leu His Ser Pro Gly Ser Ser Ser
515 520 525

Asp Ser Asn Gly Gly Asp Ala Glu Gly Pro Gly Pro Pro Ala Pro Val
530 535 540

Thr Phe Gln Gln Ile Cys Lys Asp Val His Leu Val Lys His Gln Gly
545 550 555 560

Gln Gln Leu Phe Ile Glu Ser Arg Ala Lys Pro Pro Pro Arg Pro Arg
565 570 575

Leu Leu Ala Thr Gly Thr Phe Lys Ala Lys Val Leu Pro Cys Gln Ser
580 585 590

Pro Asn Pro Glu Leu Glu Val Ala Pro Val Pro Asp Gln Ala Ser Leu
595 600 605

Ala Leu Ala Pro Glu Glu Pro Glu Arg Lys Glu Thr Ser Gly Cys Ser
610 615 620

Tyr Gln Gln Ile Asn Cys Leu Asp Ser Ile Leu Arg Tyr Leu Glu Ser
625 630 635 640

Cys Asn Ile Pro Ser Thr Thr Lys Arg Lys Cys Ala Ser Ser Ser Ser
645 650 655

Tyr Thr Ala Ser Ser Ala Ser Asp Asp Asp Lys Gln Arg Ala Gly Pro
660 665 670

Val Pro Val Gly Ala Lys Lys Asp Pro Ser Ser Ala Met Leu Ser Gly
675 680 685

Glu Gly Ala Thr Pro Arg Lys Glu Pro Val Val Gly Gly Thr Leu Ser
690 695 700

Pro Leu Ala Leu Ala Asn Lys Ala Glu Ser Val Val Ser Val Thr Ser
705 710 715 720

Gln Cys Ser Phe Ser Ser Thr Ile Val His Val Gly Asp Lys Lys Pro
725 730 735

Pro Glu Ser Asp Ile Ile Met Met Glu Asp Leu Pro Gly Leu Ala Pro
740 745 750

Gly Pro Ala Pro Ser Pro Ala Pro Ser Pro Thr Val Ala Pro Asp Pro
755 760 765

Thr Pro Asp Ala Tyr Arg Pro Val Gly Leu Thr Lys Ala Val Leu Ser
770 775 780

Leu His Thr Gln Lys Glu Glu Gln Ala Phe Leu Asn Arg Phe Arg Asp
785 790 795 800

Leu Gly Arg Leu Arg Gly Leu Asp Thr Ser Ser Val Ala Pro Ser Ala
805 810 815

Pro Gly Cys His His Gly Pro Ile Pro Pro Gly Arg Arg His His Cys
820 825 830

Arg Ser Lys Ala Lys Arg Ser Arg His His His His Gln Thr Pro Arg
835 840 845

Pro Glu Thr Pro Cys Tyr Val Ser His Pro Ser Pro Val Pro Ser Ser
850 855 860

Gly Pro Trp Pro Pro Pro Ala Thr Thr Pro Phe Pro Ala Met Val
865 870 875 880

Gln Pro Tyr Pro Leu Pro Val Phe Ser Pro Arg Gly Gly Pro Gln Pro
885 890 895

Leu Pro Pro Ala Pro Thr Ser Val Ser Pro Ala Thr Phe Pro Ser Pro
900 905 910

Leu Val Thr Pro Met Val Ala Leu Val Leu Pro Asn Tyr Leu Phe Pro
915 920 925

Thr Pro Pro Ser Tyr Pro Tyr Gly Val Ser Gln Ala Pro Val Glu Gly
930 935 940

Pro Pro Thr Pro Ala Ser His Ser Pro Ser Pro Ser Leu Pro Pro Pro
 945 950 955 960

Pro Leu Ser Pro Pro His Arg Pro Asp Ser Pro Leu Phe Asn Ser Arg
 965 970 975

Cys Ser Ser Pro Leu Gln Leu Asn Leu Leu Gln Leu Glu Glu Ser Pro
 980 985 990

Arg Thr Glu Gly Gly Ala Ala Gly Gly Pro Gly Ser Ser Ala Gly
 995 1000 1005

Pro Leu Pro Pro Ser Glu Glu Thr Ala Glu Pro Glu Ala Arg Leu Val
 1010 1015 1020

Glu Val Thr Glu Ser Ser Asn Gln Asp Ala Leu Ser Gly Ser Ser Asp
 1025 1030 1035 1040

Leu Leu Glu Leu Leu Gln Glu Asp Ser Arg Ser Gly Thr Gly Ser
 1045 1050 1055

Ala Ala Ser Gly Ser Leu Gly Ser Gly Leu Gly Ser Gly Ser Gly Ser
 1060 1065 1070

Gly Ser His Glu Gly Gly Ser Thr Ser Ala Ser Ile Thr Arg Ser Ser
 1075 1080 1085

Gln Ser Ser His Thr Ser Lys Tyr Phe Gly Ser Ile Asp Ser Ser Glu
 1090 1095 1100

Ala Glu Ala Gly Ala Ala Arg Ala Arg Thr Glu Pro Gly Asp Gln Val
 1105 1110 1115 1120

Ile Lys Cys Val Leu Gln Asp Pro Ile Trp Leu Leu Met Ala Asn Ala
 1125 1130 1135

Asp Gln Arg Val Met Met Thr Tyr Gln Val Pro Ser Arg Asp Ala Ala
 1140 1145 1150

Ser Val Leu Lys Gln Asp Arg Glu Arg Leu Arg Ala Met Gln Lys Gln
 1155 1160 1165

Gln Pro Arg Phe Ser Glu Asp Gln Arg Arg Glu Leu Gly Ala Val His
 1170 1175 1180

Ser Trp Val Arg Lys Gly Gln Leu Pro Arg Ala Leu Asp Val Met Ala
 1185 1190 1195 1200

Cys Val Asp Cys Gly Ser Ser Val Gln Asp Pro Gly His Ser Asp Asp
 1205 1210 1215

Pro Leu Phe Ser Glu Leu Asp Gly Leu Gly Leu Glu Pro Met Glu Glu
 1220 1225 1230

Gly Gly Glu Gly Gly Cys Gly Val Gly Gly Gly Gly Asp
 1235 1240 1245

Gly Gly Glu Glu Ala Gln Thr Gln Ile Gly Ala Lys Gly Ser Ser Ser
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Gln Asp Ser Ala Met Glu Glu Glu Gln Gly Gly Gly Ser Ser Ser
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Pro Ala Leu Pro Ala Glu Glu Asn Ser Thr Ser
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<400> 3

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ggg gaa tca ttt tgt cct ggg ggc gtc cca tcc cct ggg ccc cca cag	96
Gly Glu Ser Phe Cys Pro Gly Gly Val Pro Ser Pro Gly Pro Pro Gln	
20 25 30	

cac cgg cct tgc cca ggc ccc agc ctg gcc gat gac acc gat gcc aac	144
His Arg Pro Cys Pro Gly Pro Ser Leu Ala Asp Asp Thr Asp Ala Asn	
35 40 45	

agc aat ggt tca agt ggc aat gag tcc aac ggg cat gag tct aga ggc	192
Ser Asn Gly Ser Ser Gly Asn Glu Ser Asn Gly His Glu Ser Arg Gly	
50 55 60	

gca tct cag cgg agc tca cac agc tcc tcc tca ggc aac ggc aag gac	240
Ala Ser Gln Arg Ser Ser His Ser Ser Ser Gly Asn Gly Lys Asp	
65 70 75 80	

tca gcc ctg ctg gag acc act gag agc agc aag agc aca aac tct cag	288
Ser Ala Leu Leu Glu Thr Thr Glu Ser Ser Lys Ser Thr Asn Ser Gln	
85 90 95	

agc cca tcc cca ccc agc agt tcc att gcc tac agc ctc ctg agt gcc	336
Ser Pro Ser Pro Pro Ser Ser Ile Ala Tyr Ser Leu Leu Ser Ala	
100 105 110	

agc tca gag cag gac aac ccg tcc acc agt ggc tgc agc agt gaa cag	384
Ser Ser Glu Gln Asp Asn Pro Ser Thr Ser Gly Cys Ser Ser Glu Gln	
115 120 125	

tca gcc cgg gca agg act cag aag gaa ctc atg aca gca ctt cga gag	432
Ser Ala Arg Ala Arg Thr Gln Lys Glu Leu Met Thr Ala Leu Arg Glu	
130 135 140	

ctc aag ctt cga ctg ccg cca gag cgc cgg ggc aag ggc cgc tct ggg		480
Leu Lys Leu Arg Leu Pro Pro Glu Arg Arg Gly Lys Gly Arg Ser Gly		
145	150	155
160		
acc ctg gcc acg ctg cag tac gca ctg gcc tgt gtc aag cag gtg cag		528
Thr Leu Ala Thr Leu Gln Tyr Ala Leu Ala Cys Val Lys Gln Val Gln		
165	170	175
gcc aac cag gaa tac tac cag cag tgg agc ctg gag gag ggc gag cct		576
Ala Asn Gln Glu Tyr Tyr Gln Gln Trp Ser Leu Glu Glu Gly Glu Pro		
180	185	190
tgc tcc atg gac atg tcc acc tat acc ctg gag gag ctg gag cac atc		624
Cys Ser Met Asp Met Ser Thr Tyr Thr Leu Glu Glu Leu Glu His Ile		
195	200	205
acg tct gag tac aca ctt cag aac cag gat acc ttc tca gtg gct gtc		672
Thr Ser Glu Tyr Thr Leu Gln Asn Gln Asp Thr Phe Ser Val Ala Val		
210	215	220
tcc ttc ctg acg ggc cga atc gtc tac att tcg gag cag gca gcc gtc		720
Ser Phe Leu Thr Gly Arg Ile Val Tyr Ile Ser Glu Gln Ala Ala Val		
225	230	235
240		
ctg ctg cgt tgc aag cgg gac gtg ttc cgg ggt acc cgc ttc tct gag		768
Leu Leu Arg Cys Lys Arg Asp Val Phe Arg Gly Thr Arg Phe Ser Glu		
245	250	255
ctc ctg gct ccc cag gat gtg gga gtc ttc tat ggt tcc act gct cca		816
Leu Leu Ala Pro Gln Asp Val Gly Val Phe Tyr Gly Ser Thr Ala Pro		
260	265	270
tct cgc ctg ccc acc tgg ggc aca ggg gcc tca gca ggt tca ggc ctc		864
Ser Arg Leu Pro Thr Trp Gly Thr Gly Ala Ser Ala Gly Ser Gly Leu		
275	280	285
agg gac ttt acc cag gag aag tcc gtc ttc tgc cgt atc aga gga ggt		912
Arg Asp Phe Thr Gln Glu Lys Ser Val Phe Cys Arg Ile Arg Gly Gly		
290	295	300
cct gac cgg gat cca ggg cct cgg tac cag cca ttc cgc cta acc ccg		960
Pro Asp Arg Asp Pro Gly Pro Arg Tyr Gln Pro Phe Arg Leu Thr Pro		
305	310	315
320		
tat gtg acc aag atc cgg gtc tca gat ggg gcc cct gca cag ccg tgc		1008
Tyr Val Thr Lys Ile Arg Val Ser Asp Gly Ala Pro Ala Gln Pro Cys		
325	330	335
tgc ctg ctg att gca gag cgc atc cat tcg ggt tac gaa gct ccc cgg		1056
Cys Leu Leu Ile Ala Glu Arg Ile His Ser Gly Tyr Glu Ala Pro Arg		
340	345	350
ata ccc cct gac aag agg att ttc act acg cgg cac aca ccc agc tgc		1104
Ile Pro Pro Asp Lys Arg Ile Phe Thr Thr Arg His Thr Pro Ser Cys		
355	360	365

ctc ttc cag gat gtg gat gaa agg gct gcc ccc ctg ctg ggc tac ctg 1152
 Leu Phe Gln Asp Val Asp Glu Arg Ala Ala Pro Leu Leu Gly Tyr Leu
 370 375 380

ccc cag gac ctc ctg ggg gcc cca gtg ctc ctg ttc ctg cat cct gag 1200
 Pro Gln Asp Leu Leu Gly Ala Pro Val Leu Leu Phe Leu His Pro Glu
 385 390 395 400

gac cga ccc ctc atg ctg gct atc cac aag aag att ctg cag ttg gcg 1248
 Asp Arg Pro Leu Met Leu Ala Ile His Lys Lys Ile Leu Gln Leu Ala
 405 410 415

ggc cag ccc ttt gac cac tcc cct atc cgc ttc tgt gcc cgc aac ggg 1296
 Gly Gln Pro Phe Asp His Ser Pro Ile Arg Phe Cys Ala Arg Asn Gly
 420 425 430

gag tat gtc acc atg gac acc agc tgg gct ggc ttt gtg cac ccc tgg 1344
 Glu Tyr Val Thr Met Asp Thr Ser Trp Ala Gly Phe Val His Pro Trp
 435 440 445

agc cgc aag gta gcc ttc gtg ttg ggc cgc cac aaa gta cgc acg gcc 1392
 Ser Arg Lys Val Ala Phe Val Leu Gly Arg His Lys Val Arg Thr Ala
 450 455 460

ccc ctg aat gag gac gtg ttc act ccc ccg gcc ccc agc cca gct ccc 1440
 Pro Leu Asn Glu Asp Val Phe Thr Pro Pro Ala Pro Ser Pro Ala Pro
 465 470 475 480

tcc ctg gac act gat atc cag gag ctg tca gag cag atc cac cgg ctg 1488
 Ser Leu Asp Thr Asp Ile Gln Glu Leu Ser Glu Gln Ile His Arg Leu
 485 490 495

ctg ctg cag ccc gtc cac agc ccc agc ccc acg gga ctc tgt gga gtc 1536
 Leu Leu Gln Pro Val His Ser Pro Ser Pro Thr Gly Leu Cys Gly Val
 500 505 510

ggc gcc gtg aca tcc cca ggc cct ctc cac agc cct ggg tcc tcc agt 1584
 Gly Ala Val Thr Ser Pro Gly Pro Leu His Ser Pro Gly Ser Ser Ser
 515 520 525

gat agc aac ggg ggt gat gca gag ggg cct ggg cct cct gcg cca gtg 1632
 Asp Ser Asn Gly Gly Asp Ala Glu Gly Pro Gly Pro Pro Ala Pro Val
 530 535 540

act ttc cag cag atc tgt aag gat gtg cat ctg gtg aag cac cag ggc 1680
 Thr Phe Gln Gln Ile Cys Lys Asp Val His Leu Val Lys His Gln Gly
 545 550 555 560

cag cag ctt ttt att gag tct cgg gcc cgg cct cag tcc cgg ccc cgc 1728
 Gln Gln Leu Phe Ile Glu Ser Arg Ala Arg Pro Gln Ser Arg Pro Arg
 565 570 575

ctc cct gct aca ggc acg ttc aag gcc aag gcc ctt ccc tgc caa tcc 1776
 Leu Pro Ala Thr Gly Thr Phe Lys Ala Lys Ala Leu Pro Cys Gln Ser
 580 585 590

cca gac cca gag ctg gag gcg ggt tct gct ccc gtc cag gcc cca cta		1824	
Pro Asp Pro Glu Leu Glu Ala Gly Ser Ala Pro Val Gln Ala Pro Leu			
595	600	605	
gcc ttg gtc cct gag gag gcc gag agg aaa gaa gcc tcc agc tgc tcc		1872	
Ala Leu Val Pro Glu Glu Ala Glu Arg Lys Glu Ala Ser Ser Cys Ser			
610	615	620	
tac cag cag atc aac tgc ctg gac agc atc ctc agg tac ctg gag agc		1920	
Tyr Gln Gln Ile Asn Cys Leu Asp Ser Ile Leu Arg Tyr Leu Glu Ser			
625	630	635	640
tgc aac ctc ccc agc acc act aag cgt aaa tgt gcc tcc tcc tcc		1968	
Cys Asn Leu Pro Ser Thr Thr Lys Arg Lys Cys Ala Ser Ser Ser			
645	650	655	
tat acc acc tcc tca gcc tct gac gac agg cag agg aca ggt cca		2016	
Tyr Thr Thr Ser Ser Ala Ser Asp Asp Arg Gln Arg Thr Gly Pro			
660	665	670	
gtc tct gtg ggg acc aag aaa gat ccg ccg tca gca gcg ctg tct ggg		2064	
Val Ser Val Gly Thr Lys Lys Asp Pro Pro Ser Ala Ala Leu Ser Gly			
675	680	685	
gag ggg gcc acc cca cg ^g aag gag cca gtg gtg gga ggc acc ctg agc		2112	
Glu Gly Ala Thr Pro Arg Lys Glu Pro Val Val Gly Gly Thr Leu Ser			
690	695	700	
ccg ctc gcc ctg gcc aat aag gcg gag agt gtg gtg tcc gtc acc agt		2160	
Pro Leu Ala Leu Ala Asn Lys Ala Glu Ser Val Val Ser Val Thr Ser			
705	710	715	720
cag tgt agc ttc agc tcc acc atc gtc cat gtg gga gac aag aag ccc		2208	
Gln Cys Ser Phe Ser Ser Thr Ile Val His Val Gly Asp Lys Lys Pro			
725	730	735	
ccg gag tcg gac atc atc atg atg gag gac ctg cct ggc cta gcc cca		2256	
Pro Glu Ser Asp Ile Ile Met Met Glu Asp Leu Pro Gly Leu Ala Pro			
740	745	750	
ggc cca gcc ccc agc cca gcc ccc agc ccc aca gta gcc cct gac cca		2304	
Gly Pro Ala Pro Ser Pro Ala Pro Ser Pro Thr Val Ala Pro Asp Pro			
755	760	765	
gcc cca gac gcc tac cgt cca gtg ggg ctg acc aag gcc gtg ctg tcc		2352	
Ala Pro Asp Ala Tyr Arg Pro Val Gly Leu Thr Lys Ala Val Leu Ser			
770	775	780	
ctg cac aca cag aag gaa gag caa gcc ttc ctc agc cgc ttc cga gac		2400	
Leu His Thr Gln Lys Glu Glu Gln Ala Phe Leu Ser Arg Phe Arg Asp			
785	790	795	800
ctg ggc agg ctg cgt gga ctc gac agc tct tcc aca gct ccc tca gcc		2448	
Leu Gly Arg Leu Arg Gly Leu Asp Ser Ser Thr Ala Pro Ser Ala			
805	810	815	

ctt ggc gag cga ggc tgc cac cac ggc ccc gca ccc cca agc cgc cga 2496
 Leu Gly Glu Arg Gly Cys His His Gly Pro Ala Pro Pro Ser Arg Arg
 820 825 830

cac cac tgc cga tcc aaa gcc aag cgc tca cgc cac cac cag aac cct 2544
 His His Cys Arg Ser Lys Ala Lys Arg Ser Arg His His Gln Asn Pro
 835 840 845

cg gct gaa gcg ccc tgc tat gtc tca cac ccc tca ccc gtg cca ccc 2592
 Arg Ala Glu Ala Pro Cys Tyr Val Ser His Pro Ser Pro Val Pro Pro
 850 855 860

tcc acc ccc tgg ccc acc cca cca gcc act acc ccc ttc cca gcg gtt 2640
 Ser Thr Pro Trp Pro Thr Pro Pro Ala Thr Thr Pro Phe Pro Ala Val
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 Pro Leu Val Thr Pro Met Val Ala Leu Val Leu Pro Asn Tyr Leu Phe
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 Gly Glu Pro Phe Cys Pro Gly Gly Val Pro Ser Pro Gly Ala Pro Gln
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 His Arg Pro Cys Pro Gly Pro Ser Leu Ala Asp Asp Thr Asp Ala Asn
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 Ser Asn Gly Ser Ser Gly Asn Glu Ser Asn Gly Pro Glu Ser Arg Gly
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 65 70 75 80

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 Ser Ala Leu Leu Glu Thr Thr Glu Ser Ser Lys Ser Thr Asn Ser Gln
 85 90 95

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 Ser Pro Ser Pro Ser Ser Ile Ala Tyr Ser Leu Leu Ser Ala
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Ala Asn Gln Glu Tyr Tyr Gln Trp Ser Leu Glu Glu Gly Glu Pro	
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Cys Ala Met Asp Met Ser Thr Tyr Thr Leu Glu Glu Leu Glu His Ile	
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Lys Asp Phe Thr Gln Glu Lys Ser Val Phe Cys Arg Ile Arg Gly Gly	
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Pro Asp Arg Asp Pro Gly Pro Arg Tyr Gln Pro Phe Arg Leu Thr Pro	
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Tyr Val Thr Lys Ile Arg Val Ser Asp Gly Ala Pro Ala Gln Pro Cys	
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Cys Leu Leu Ile Ala Glu Arg Ile His Ser Gly Tyr Glu Ala Pro Arg	
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Ile Pro Pro Asp Lys Arg Ile Phe Thr Thr Arg His Thr Pro Ser Cys	
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Asp Arg Pro Leu Met Leu Ala Ile His Lys Lys Ile Leu Gln Leu Ala			
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Gly Gln Pro Phe Asp His Ser Pro Ile Arg Phe Cys Ala Arg Asn Gly			
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Glu Tyr Val Thr Met Asp Thr Ser Trp Ala Gly Phe Val His Pro Trp			
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Ser Arg Lys Val Ala Phe Val Leu Gly Arg His Lys Val Arg Thr Ala			
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Pro Leu Asn Glu Asp Val Phe Thr Pro Pro Ala Pro Ser Pro Ala Pro			
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500	505	510	
ggc cct ctg atg tcc cct ggt cct cta cac agc cct ggc tcc tcc agt		1584	
Gly Pro Leu Met Ser Pro Gly Pro Leu His Ser Pro Gly Ser Ser Ser			
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Asp Ser Asn Gly Gly Asp Ala Glu Gly Pro Gly Pro Pro Ala Pro Val			
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Thr Phe Gln Gln Ile Cys Lys Asp Val His Leu Val Lys His Gln Gly			
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Gln Gln Leu Phe Ile Glu Ser Arg Ala Lys Pro Pro Arg Pro Arg			
565	570	575	
ctc ctt gct aca ggt aca ttc aaa gcc aaa gtc ctt ccc tgc cag tcc		1776	
Leu Leu Ala Thr Gly Thr Phe Lys Ala Lys Val Leu Pro Cys Gln Ser			
580	585	590	

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 Pro Asn Pro Glu Leu Glu Val Ala Pro Val Pro Asp Gln Ala Ser Leu
 595 600 605

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 Ala Leu Ala Pro Glu Glu Pro Glu Arg Lys Glu Thr Ser Gly Cys Ser
 610 615 620

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tgc aac att ccc agt aca acc aag cgt aaa tgt gcc tcc tcc tcc 1968
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Pro Gly Cys His His Gly Pro Ile Pro Pro Gly Arg Arg His His Cys			
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Pro Glu Thr Pro Cys Tyr Val Ser His Pro Ser Pro Val Pro Ser Ser			
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Gly Pro Trp Pro Pro Pro Ala Thr Thr Pro Phe Pro Ala Met Val			
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Gln Pro Tyr Pro Leu Pro Val Phe Ser Pro Arg Gly Gly Pro Gln Pro			
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